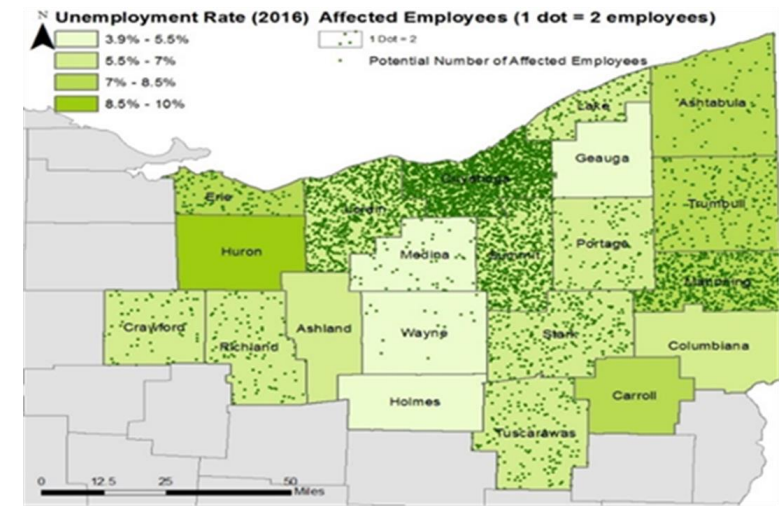# 2018 IEDC Economic Future Forum
Industry Forecasts and Roundtables:
MANUFACTURING

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Buffalo, NY

June 25, 2018

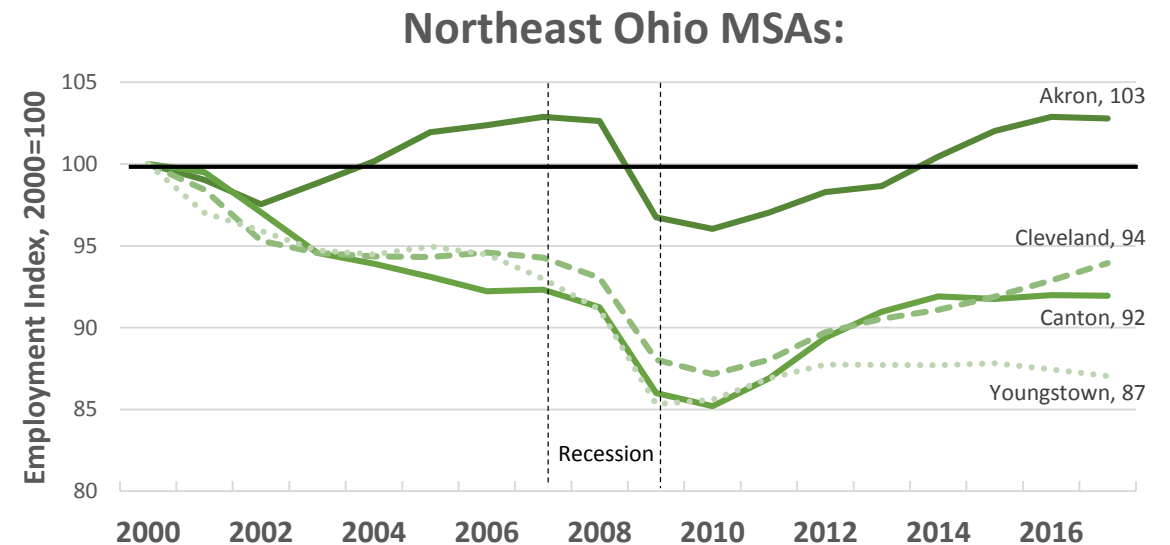# Northeast Ohio – the Heart of Ohio Manufacturing

- NEO, a 21-county region -- 38% of Ohio's population, employment, and GDP

- About 40% of Ohio manufacturing

- Includes three metropolitan areas, with central cities – Cleveland, Akron (+ Canton), and Youngstown

- 42% of families in NEO are categorized as low income

- 2013-2015, Ohio and the U.S. gained population (0.4% & 1.6%), NEO lost population (-1.6%)

- NEO's employment growth rate is only 2/3 that of Ohio

Employment Trends, 2000 to 2017

➢ The nation and the state employment grow at faster rates than the Northeast Ohio region
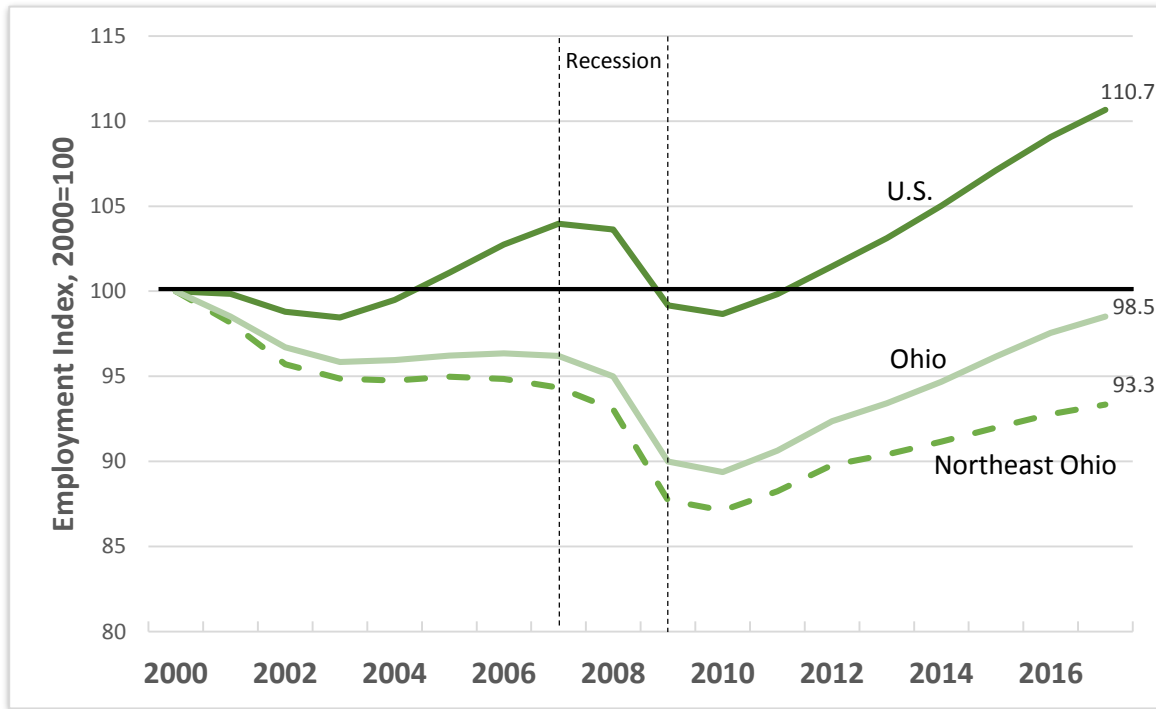
➢ In Northeast Ohio, Akron MSA has recovered since recession in 2008

Cleveland MSA vs. Midwest MSAs

Regional Employment Trends, 2000 to 2017

Recession

Indianapolis, 118
Columbus, 116
Minneapolis, 111
Cincinnati, 108
St. Louis, 103
Pittsburgh, 102
Milwaukee, 99
Cleveland, 94
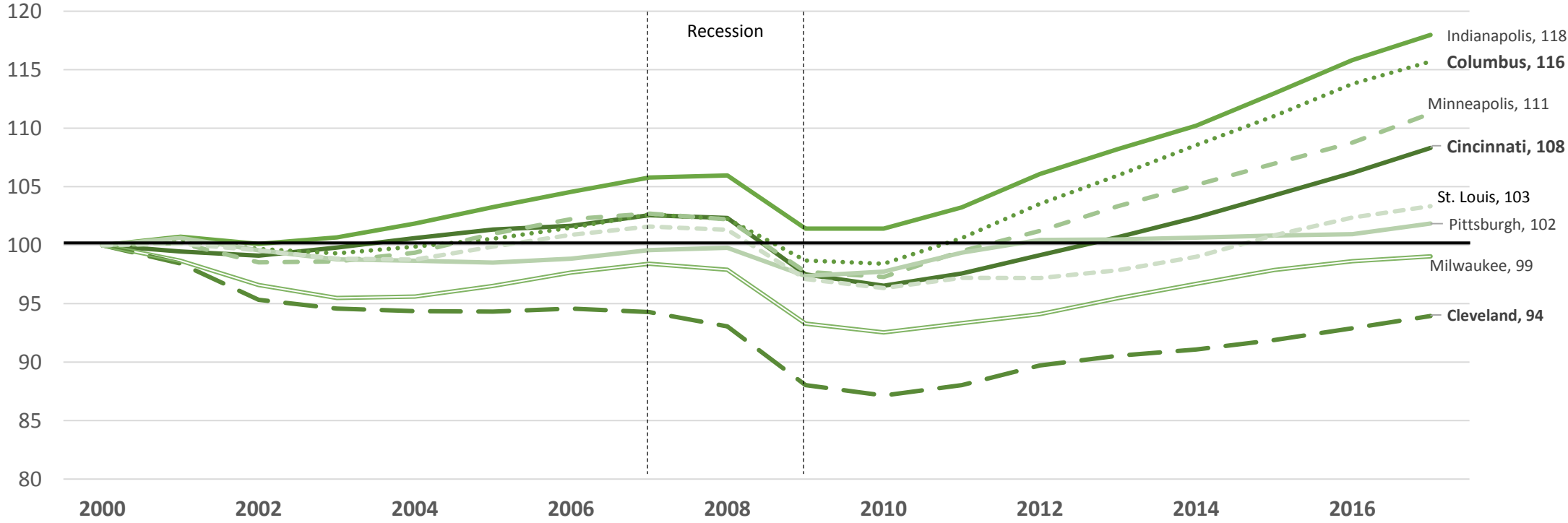
Source: Moody's economy.com

➢ Cleveland MSA has the lowest employment growth since 2000 amongst similar Midwest MSAs

Gross Regional Product Trends, 2000 to 2017

Source: Moody's economy.com
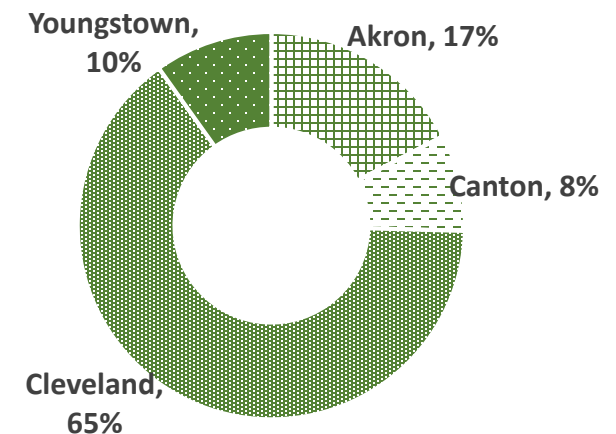
Gross Product Share by MSA, 2017

➤ Northeast Ohio's gross product recovered since 2009 recession

Contribution of Mfg, Services, & Ag (2017)

Sector	Employment Share		Share of GDP		Productivity (GDP/Employee)	
	U.S.	Northeast Ohio	U.S.	Northeast Ohio	U.S.	Northeast Ohio
Manufacturing	9%	13%	13%	19%	$183,104	$161,375
Service*	89%	86%	87%	81%	$121,539	$105,947
Agriculture	2%	1%	1%	0.3%	$47,846	$25,098

Source: Moody's economy.com

➢ NEO is 4% heavier in manufacturing than the U.S. and has 12% lower productivity in manufacturing than the U.S.

➢ NEO productivity in service sector lags the U.S. by 13%

* Service includes Utilities; Wholesale Trade; Retail Trade; Transportation and Warehousing; Information; Finance and insurance; Real estate; Professional Services; Management; Administrative Services; Education Services; Health Care; Arts; Accommodation; Other Services; and Public Administration

# American Manufacturing Decline or Productivity Growth?

- Globalization and automation

- Growth of productivity; really?

- Computers and semiconductors – about 13% of value-added in manufacturing

- Weak performance by other than the Computer and electronic product manufacturing (NAICS 333-334)

- How weak are the economies of non-costal regions?

NEO vs. US Productivity in Manufacturing
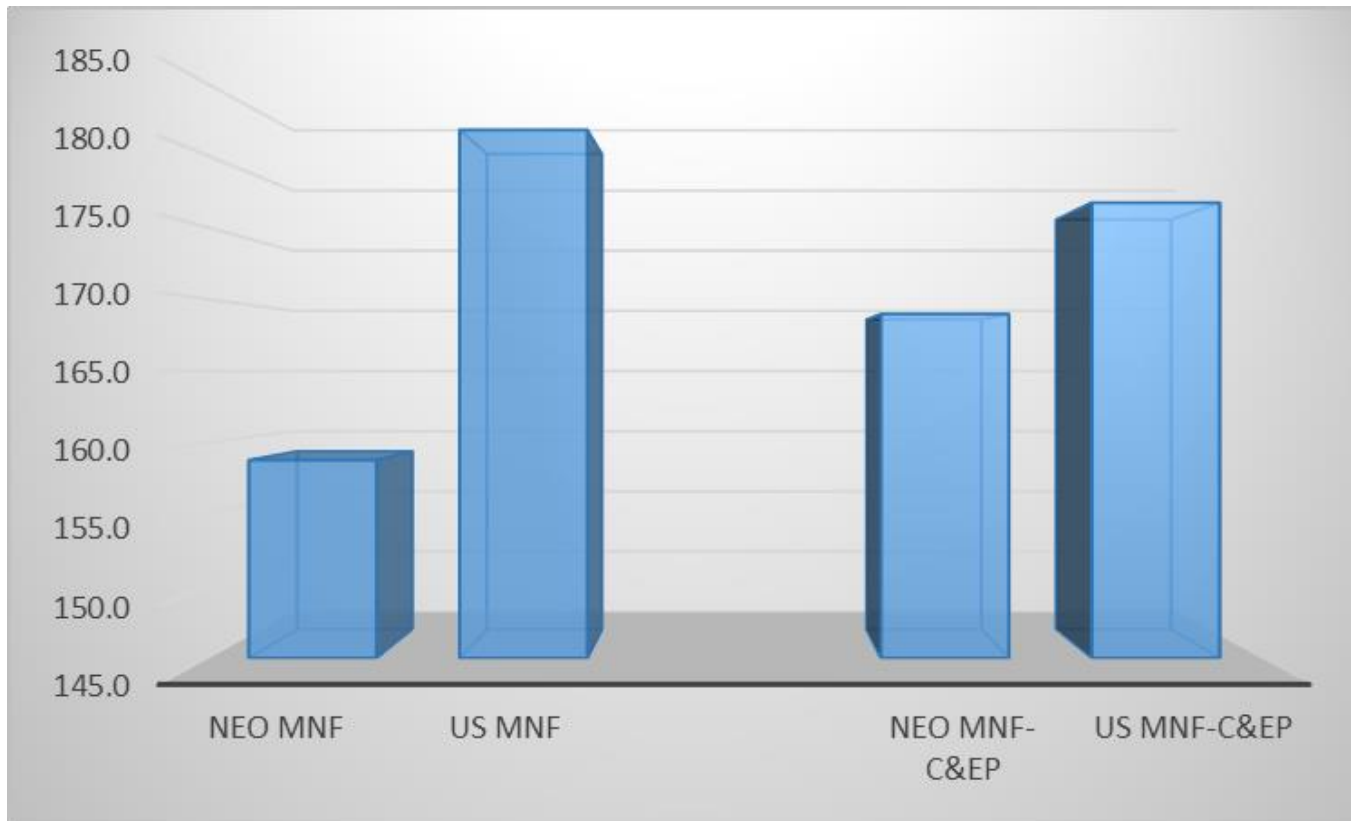
- Total Manufacturing productivity in NEO lags the US by **-12.6%**

- Manufacturing productivity of NEO without the Computer and Electronic Product Manufacturing lags the US by **-4.4%**

Jobs in Manufacturing

- Growth of productivity in C&EP does not reflect increase of physical output

- Due to specialization, efficiency and globalization, we purchase imports

- Automation – competition with low-wage countries and technological change

- Advanced and Additive manufacturing captures attention of ED

- Shortage of STEM and general labor

- Soft skills and working with HS's councilors and principals

Portfolio Approach:

Invest in the Place
Target the Industry
Build Regional Consensus

Building Shared Regional ED Agenda

June 17, 2018 4:01 am   UPDATED 2 DAYS AGO

Cleveland's economy fails to gain traction

A better job of measuring performance is key to turning around region's fortunes

By JAY MILLER

Fund for Our Economic Future   Team NEO
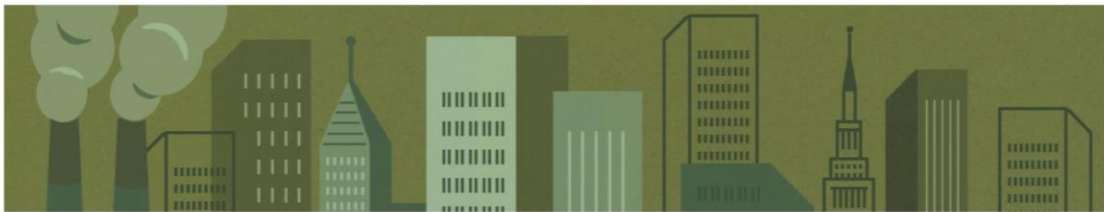
- Regional Economic Advisory Group **(PB)**

- Re-assess economic clusters: economic base, declining, and emerging industry clusters **(IB)**

- Quarterly Economic Dashboard **(IB)**

- Accessibly of jobs by low-income population **(PB)**

- Examine new product development and technology applications by SMM **(I+PB)**

- Economic inclusion Roundtable **(PB)**

- Supported by the George Gund Foundation and U.S. EDA University Center Grant

Investing in the Industry

- Mature clusters with ability to develop or rejuvenate their product – driver industries

- Emerging clusters and driver industries with regional competitive advantage

- "A state interested in promoting manufacturing employment, or fighting its loss, would do well to be specific in its goals and to focus on the manufacturing subcategories that best match the conditions and policies the state is able to deliver." Adkinsson & Ricketts (2016). Exploring the redistribution of manufacturing employment among the American States in the face of overall declines in employment. *Economic Development Quarterly*, Vol. 30(3), 215-231.

  - Actual or latent availability of female workers: **(+)** 312-beverage and tobacco products; 314 - textile; 326 - plastic & rubber; 336 - transportation equipment; 337 - furniture ad fixtures; **(-)** 331 - primary metal; 322 - paper

  - Proxy for state labor cost in the industry: **(+)** 333 – machinery except electrical; 339-miscellaneous; **(-)** 327 – nonmetallic mineral products; 332-fab metal

- Only SMMs with product development component are going to survive and grow

Investing in the Place: Factor Loadings -- 115 MSAs 55 variables

- Factor 1 – Talent, education, and innovation – 18.4%

- Factor 2 – Economic polarization and opportunity – 16.2%

- Factor 3 - Entrepreneurship and inclusion – 12.9%

- Factor 4 - Business cost – 9.4%

- Factor 5 – Dynamics of place – 7.7%

- Factor 6 – Commuter hubs – 6.8%

Variable	Factor 1: Talent, Education, and Innovation	Factor 2: Economic Polarization and Opportunity	Factor 3: Entrepreneurship and Inclusion	Factor 4: Business Costs	Factor 5: Dynamics of Place	Factor 6: Commuter Hubs
Advanced Degree	0.8226	-0.3336	0.0088	0.1636	-0.0016	0.1206
STEM Occupations	0.7958	-0.1169	0.0123	-0.1313	0.0458	-0.0148
Industry R&D	0.7480	0.0198	0.2193	0.1609	0.0911	-0.0795
Bachelor Degree	0.7217	-0.4523	0.0738	-0.2047	0.0913	0.2332
University R&D	0.7053	0.1726	-0.1219	0.0403	-0.0381	-0.0729
Population Dependency	-0.6954	0.0780	0.3165	-0.0791	-0.0687	-0.2365
SBIR & STTR Awards	0.6943	0.0197	0.0815	0.0612	-0.0346	-0.2215
Management Occupations	0.6209	-0.0945	0.1515	0.0426	0.3218	0.2579
Technology Transfer	0.5774	0.0391	-0.0010	-0.0414	0.0455	0.2275
Art & Entertainment occupations	0.5659	-0.3710	0.2016	-0.1209	0.0292	0.1701
Patents	0.5528	-0.1702	0.3277	0.1282	0.1588	-0.0408
Education Expenditures (K-12)	-0.5258	0.2961	0.1415	0.3548	0.1427	-0.3205
Non-Car Commute	0.4823	-0.0413	0.3858	0.3745	-0.0582	0.0206
Rent Cost Index	0.4318	-0.2234	0.2534	0.2208	-0.1196	0.2410
Venture Capital	0.4168	-0.0144	0.2636	-0.0046	0.0896	-0.0587
Share of STEM Degrees	0.4079	0.0780	-0.3777	-0.0369	-0.0555	0.0112
Income Inequality	-0.0084	0.8005	-0.0109	0.0548	0.0528	0.1672
Poverty Rate	-0.3516	0.7837	0.1210	-0.1265	0.0566	-0.2327
Minority Business Ownership	-0.0569	0.7348	0.3913	0.1133	0.0156	0.1116
Laborforce Participation Rate	0.2494	-0.6903	-0.1205	-0.0158	0.3821	0.2533
Property Crime	-0.0747	0.6271	-0.2673	-0.2614	-0.1224	0.0619
Broadband	0.3744	-0.6188	0.2064	0.2698	-0.2962	0.2497
Health Insurance Coverage	0.3135	-0.6026	-0.5065	0.4208	0.0859	0.0847
Violent Crime	-0.1140	0.5777	-0.2127	0.0043	-0.1534	0.3456
City to Metro Poverty	0.0006	-0.5609	-0.2568	0.3346	0.3201	0.0109
Low Income Rate	-0.4804	0.5522	0.1556	-0.3656	-0.0782	-0.2677
Housing Ownership	-0.3648	-0.5049	-0.3605	-0.2626	-0.1532	0.0020
High School Dropouts	-0.2781	0.4130	0.0113	-0.1326	0.0039	0.0708
Foreign Born	0.1202	0.3749	0.8115	0.2670	0.1489	0.0439
Obesity	-0.3342	0.2665	-0.7152	-0.0925	0.1098	-0.0576
Self Employment	-0.1243	-0.0679	0.7151	-0.1271	-0.2235	0.0219
Dissimilarity Index: Hispanic	-0.0019	-0.1396	-0.6563	0.1817	0.1217	0.2589
Housing Burden	0.0504	0.1394	0.6487	0.4813	-0.1419	0.2918
Establishment Birth Rate	0.0248	0.2080	0.5789	-0.3913	-0.3142	0.1528
Unionization Rate	-0.0077	-0.0788	-0.0221	0.8095	0.1263	-0.0079
Tax Cost Index	0.0175	-0.3771	0.0536	0.7662	0.1054	-0.0884
Energy Cost Index	0.0356	0.1350	0.3717	0.6864	-0.0445	0.0784
Vacant Housing	-0.3668	0.1222	0.1152	-0.2198	-0.6571	0.1198
Dissimilarity Index: African-American	0.0351	-0.2348	0.1081	0.0720	0.6270	0.0290
Business Churning	0.0694	0.3510	-0.3690	0.2592	0.6112	-0.2581
Manufacturing Share	0.0532	-0.3435	-0.2485	0.0536	0.4736	-0.2779
Significant Commute Time	0.1539	-0.0580	0.0722	0.1049	-0.1098	0.8148
Domestic Air Travel (Zeros Imputed)	0.2618	-0.0215	0.1852	-0.1597	0.0472	0.6217
Workforce Replacement Rate	0.1298	0.3563	0.1938	-0.0304	0.2849	-0.3207
Unemployment	-0.4246	0.4109	0.3468	0.3048	-0.0566	0.0528
Traded Industries	-0.3406	0.1879	0.2427	0.1504	-0.2642	-0.1307
Small Business Establishments	-0.0995	0.0480	0.5499	0.1022	-0.5397	-0.1109
No. of Government Units	-0.2143	-0.3958	0.0251	0.0251	0.2864	-0.1983
Live/Work Different County	0.0125	-0.2807	-0.4093	-0.0565	0.0808	0.4253
Labor Cost Index	0.3797	-0.0461	-0.0077	0.0446	0.0742	0.3551
Female Business Ownership	0.2575	0.3540	0.0533	0.4354	-0.2952	0.2472
Educational Certificates	0.0101	0.3934	0.2052	-0.1608	0.0012	-0.0760
Brain Gain	0.3321	0.1057	0.1800	-0.3714	0.3437	-0.0547
Associate Degree	0.0693	-0.3133	-0.1059	0.3339	-0.4093	-0.1863
Air Quality	0.0832	-0.1271	0.2570	0.2094	-0.4415	-0.3307

Factor 1: Talent, Education, and Innovation

Advanced Degree	0.8226
STEM Occupations	0.7958
Industry R&D	0.7480
Bachelor Degree	0.7217
University R&D	0.7053
Population Dependency	-0.6954
SBIR & STTR Awards	0.6943
Management Occupations	0.6209
Technology Transfer	0.5774
Art & Entertainment occupations	0.5659
Patents	0.5528
Education Expenditures (K-12)	-0.5258
Non-Car Commute	0.4823
Rent Cost Index	0.4318
Venture Capital	0.4168
Share of STEM Degrees	0.4079

*This factor explains **18.4%, the largest share**, of the total variation in the dataset.   It includes 16 variables.*

- The largest share of variation – 18.4%; "driven" by % of population with advanced degrees (corr = 82%) and % of occupations in computer & mathematical sciences, architecture & engineering, and life & physical science (79.6%)

- The phenomena of the factor relates to **education** by high positive correlation with such variables as percentage of population over 25 with advanced degree (82%), bachelor degree (72.2%), and share of STEM degrees (40.8%)

- **Innovation** -- high correlation with industry and university R&D (74.8% & 70.5%), SBIR & STTR awards (69.4%), technology transfer (57.7%), patents (55.3%) and venture capital (41.7%)

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MSAs with High Factor 1 Loadings

Positive Factor Loadings	Negative Factor Loadings
Durham-Chapel Hill, NC	Visalia-Porterville, CA
San Jose-Sunnyvale-Santa Clara, CA	Brownsville-Harlingen, TX
Madison, WI	McAllen-Edinburg-Mission, TX
Seattle-Tacoma-Bellevue, WA Metro Area	Port St. Lucie, FL
Huntsville, AL	Lakeland-Winter Haven, FL
San Diego-Carlsbad-San Marcos, CA	Youngstown-Warren-Boardman, OH-PA
Austin-Round Rock-San Marcos, TX	Cape Coral-Fort Myers, FL
Santa Barbara-Santa Maria-Goleta, CA	North Port-Bradenton-Sarasota, FL
Tucson, AZ	Modesto, CA
Raleigh-Cary, NC	Canton-Massillon, OH

Factor 2: Economic Polarization and Opportunity

Income Inequality	0.8005
Poverty Rate	0.7837
Minority Business Ownership	0.7348
Labor force Participation Rate	-0.6903
Property Crime	0.6271
Broadband	-0.6188
Health Insurance Coverage	-0.6026
Violent Crime	0.5777
City to Metro Poverty	-0.5609
Low Income Rate	0.5522
Housing Ownership	-0.5049
High School Dropouts	0.4130

*This factor explains **16.2%** of the total variation in the dataset*
It includes 12 variables

- The second "most powerful" factor, explaining 16.2% of variation; "driven" by income inequality (80.0%) & poverty rate (78.4%)

- **Economic polarization --** income inequality (80.0%), poverty rate (78.4%), property & violent crime (62.7% & 57.8%), city to metro poverty (-56.1%), low percentage of population with income between 125% and 200% poverty level & low health insurance coverage (55.2% and -60.2%), low housing ownership (-50.5%), and high rate of school dropouts (41.3%)

- **Economic inclusion creates opportunity for regions to achieve positive economic outcomes**

Factor 3: Entrepreneurship and Inclusion

Foreign Born	0.8115
Obesity	-0.7152
Self Employment	0.7151
Dissimilarity Index: African American	-0.6563
Housing Burden	0.6487
Establishment Birth Rate	0.5789

This factor explains 10.1% of the total variation in the dataset.
It includes 6 variables

- 12.9% of the total variation; "driven" by % of foreign born (81.1%) and % of adults that are self-employed (71.5%)

- The phenomena of this factor reflects the level of entrepreneurship in the region and social inclusion

- **Entrepreneurship** -- self employment (71.5%) & business start-ups (57.9%)

- Entrepreneurial regions are also less segregated. **Inclusion** is represented by the percentage of foreign born (81.1%) & low segregation of African-American population (dissimilarity index -65.9%)

Manufacturing -- Factor 5: Dynamics of Place

Vacant Housing	-0.6571
Dissimilarity Index: Hispanic	0.6270
Business Churning	0.6112
Manufacturing Share	0.4736

This factor explains 6.2% of the total variation in the dataset.
It includes 4 primary variables

- This factor is "driven" by the percentage of vacant housing units (correlation with the factor at -65.7%) and high business churning – business expansions and contractions (61.1%).

- **Dynamics of place** is associated with the phenomena represented by high manufacturing share in the regional economy (47.4%) and high business churning (61.1%).

- The regions with large share of manufacturing in their economy also have low vacant housing (-65.7%) and high segregation of Hispanic population (62.7%)

Co-Working Market: Not Only Shared Economy

- In 2017, **1.27 million** people in 15,500 spaces around the world Demand is growing 10%-15% per year (*Cushman & Wakefield, 2017*)

- In 2018, **2.3 million** co-working members in the global market; will balloon to 5.1 million by 2022 (*Global Coworking Unconference Conference, 2018*)

- **Tenants**: self-employed, freelancers, entrepreneurs, small businesses, telecommuters, large companies

- **Benefits** to tenants: dynamic environment, faster problem solving, higher productivity, flexibility, cost savings

- Benefits to **regions**: "cool economy," attract creative workers, attract new companies to enter the region, support SMM

Office Rent vs. Co-working Supply
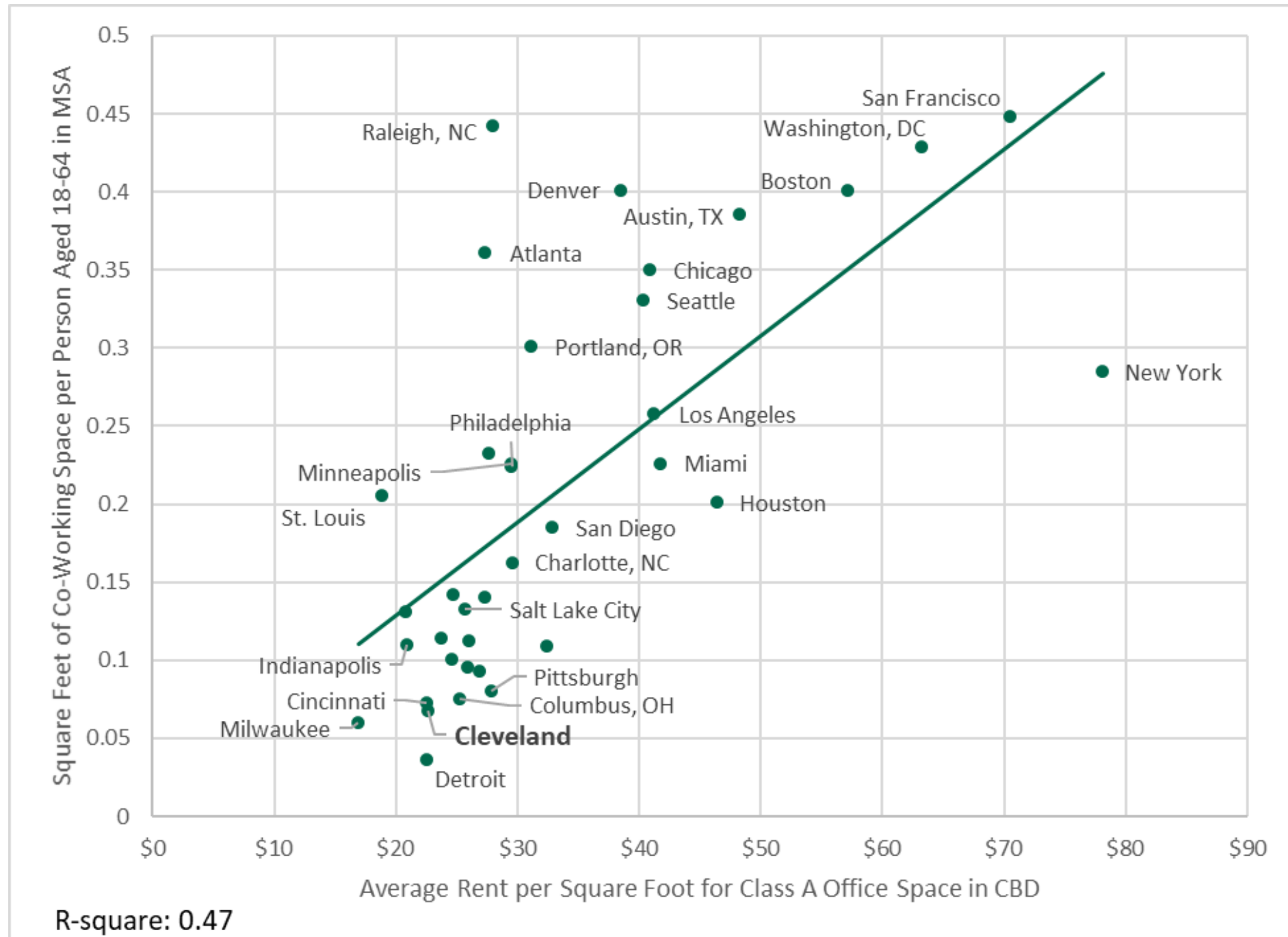
Summary

- Invest in the place and targeted industries
  - Connect jobs and people
  - Smart targets built on the strength
  - Develop infrastructure

- Economic and social inclusion is the key for workforce development, entrepreneurship, and innovation

- Build regional consensus: in strategy, policy and measurement

- Invest in "cool economy," attract creative workers, attract new companies to enter the region, support new product development at SMM

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Title	Number of Downloads
Additive Manufacturing: A Summary of the Literature	743
Measuring Entrepreneurial Ecosystems	541
Machining: A Summary of the Literature	256
Molding: A Summary of the Literature	249
Understanding Electricity Markets in Ohio	244
Box Office Ohio: Analysis and Economic Impact of the Film Industry in Northeast Ohio and Ohio	177
Mapping the Opportunities for Shale Development in Ohio	170
University Circle & Little Italy Study: Demographic Trends, Property Assessment, and Recommendations for Neighborhood Revitalization	170
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